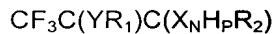


WHAT IS CLAIMED IS:

1. A dehydrohalogenation process for the preparation of fluoropropenes of the formula
 $CF_3CY=CX_NH_P$, wherein X and Y are independently hydrogen or a halogen selected from the group
5 consisting of fluorine, chlorine, bromine and iodine; and N and P are independently integers equal to
0,1 or 2, provided that $(N+P)=2$; comprising reacting without a catalyst, a halopropane of the formula:



10 wherein R_1 , R_2 , X and Y are independently hydrogen or a halogen selected from the group consisting
of fluorine, chlorine, bromine and iodine, provided that at least one of R_1 , R_2 , X and Y is a halogen
and there is at least one hydrogen and one halogen on adjacent carbon atoms; with a caustic solution
of at least one alkali metal or alkaline earth metal hydroxide in a non-aqueous, non-alcohol solvent for
said alkali metal or alkaline earth metal hydroxide that is essentially miscible with said halopropane,
15 wherein the reaction is performed within a temperature range at which dehydrohalogenation will
occur.

2. The process of claim 1 wherein the reactant comprises 1-chloro-1,3,3,3-tetrafluoropropane.

20 3. The process of claim 1 wherein the reactant comprises 1,1,1,3,3-pentafluoropropane.

4. The process of claim 1 wherein the reactant comprises both 1-chloro-1,3,3,3-tetrafluoropropane and
1,1,1,3,3-pentafluoropropane.

25 5. The process of claim 1 wherein said caustic solution comprises LiOH, NaOH, KOH, CaO, $Ca(OH)_2$,
 $CaCO_3$, lime stone or combinations thereof.

6. The process of claim 1, wherein said caustic solution solvent is selected from the group consisting of nitriles, ethers, esters, amides, ketones, sulfoxides, phosphates and carboxylates.

7. The process of claim 1, wherein said caustic solution solvent is acetonitrile.

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8. The process of claim 1, wherein said caustic solution solvent is diethyl ether.

9. The process of claim 1, wherein said caustic solution solvent is tetrahydrofuran.

10 10. The process of claim 1, wherein said caustic solution solvent is perfluorotetrahydrofuran.

11. The process of claim 1, wherein said caustic solution solvent is methyl acetate.

12. The process of claim 1, wherein said caustic solution solvent is ethyl acetate.

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13. The process of claim 1 wherein said dehydrochlorination of 1-chloro-1,3,3,3-tetrafluoropropane and said dehydrofluorination of 1,1,1,3,3-pentafluoropropane are conducted simultaneously in the same reactor.

20 14. The process of claim 1 wherein the reaction is conducted at a temperature of from about 20°C to about 150°C.

15. The process of claim 1 wherein the reaction is conducted at atmospheric pressure or under vacuum.

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16. The process of claim 1 wherein the reaction is conducted at superatmospheric pressure.

17. The process of claim 1 wherein the caustic strength of said caustic solution is from about 2 wt % to about 100 wt %.

5 18. The process of claim 1, wherein the molar ratio of caustic to halopropane is about 1:1 to about 20:1.

10 19. The process of claim 1 wherein the 1-chloro-1,3,3,3-tetrafluoropropane and/or 1,1,1,3,3-pentafluoropropane are previously prepared by fluorinating 1,1,1,3,3-pentachloropropane with hydrogen fluoride in a vapor phase in the presence of a fluorination catalyst.

15 20. The process of claim 19 wherein said fluorination catalyst is selected from the group consisting of transition metal halides, Group IVb metal halides, Group Vb metal halides and combinations thereof on activated carbon or fluorinated alumina.

21. The process of claim 19 wherein said fluorination catalyst is selected from the group consisting of SbCl₅, SbCl₃, SbF₅, TaCl₅, SnCl₄, NbCl₅, TiCl₄, MoCl₅, Cr₂O₃, Cr₂O₃/Al₂O₃, Cr₂O₃/AlF₃, Cr₂O₃/carbon, CoCl₂/Cr₂O₃/Al₂O₃, NiCl₂/Cr₂O₃/Al₂O₃, CoCl₂/AlF₃, NiCl₂/AlF₃ and combinations thereof.

22. The process of claim 19 wherein said fluorination catalyst is selected from the group consisting of Cr₂O₃, Cr₂O₃/carbon, Cr₂O₃/AlF₃, CoCl₂/AlF₃, NiCl₂/AlF₃ and combinations thereof.

23. The process of claim 19 wherein said fluorination catalyst comprises SbCl₃ or SbCl₅ supported on activated carbon.

24. The process of claim 1 wherein the 1-chloro-1,3,3,3-tetrafluoropropane and/or 1,1,1,3,3-pentafluoropropane are previously prepared by fluorinating 1,1,1,3,3-pentachloropropane with hydrogen fluoride in a liquid phase in the presence of a fluorination catalyst.

25. The process of claim 24 wherein said fluorination catalyst is selected from the group consisting of transition metal halides, Group IVb metal halides, Group Vb metal halides and combinations thereof.

26. The process of claim 24 wherein said fluorination catalyst is selected from the group consisting of 5 SbCl_5 , SbCl_3 , SbF_5 , TaCl_5 , SnCl_4 , NbCl_5 , TiCl_4 , MoCl_5 , and combinations thereof.

27. The process of claim 24 wherein said fluorination catalyst is selected from the group consisting of 10 SbCl_5 , SbCl_3 and combinations thereof.

28. The process of claim 19 wherein the fluorination is conducted at a temperature of from about 100°C to about 350°C.

29. The process of claim 19 wherein the fluorination is conducted at atmospheric pressure or under 15 vacuum.

30. The process of claim 29, wherein the fluorination is conducted under vacuum pressure between about 5 and about 760 torr.

31. The process of claim 19, wherein said fluorination is conducted at superatmospheric pressure.

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32. The process of claim 19 wherein the mole ratio of hydrogen fluoride to 1,1,1,3,3-pentachloropropane is from about 2:1 to about 100:1.

33. The process of claim 19 further comprising feeding chlorine to the fluorination reaction to keep the 25 fluorination catalyst active.

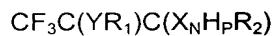
34. The process of claim 24 wherein the fluorinating is conducted at a temperature of from about 60°C to about 180°C.

35. The process of claim 24 wherein the fluorinating is conducted at a pressure of from about 50 psig
5 and 400 psig.

36. The process of claim 24 wherein the mole ratio of hydrogen fluoride to 1,1,1,3,3-pentachloropropane is from about 2:1 to about 100:1.

10 37. The process of claim 24 further comprising feeding chlorine to the fluorination reaction to keep the fluorination catalyst active.

38. A dehydrohalogenation process for the preparation of fluoropropenes of the formula
CF₃CY=CX_NH_P, wherein X and Y are independently hydrogen or a halogen selected from the group
15 consisting of fluorine, chlorine, bromine and iodine, and N and P are independently integers equal to 0, 1 or 2, provided that (N+P)=2; comprising heating to a temperature at which dehydrohalogenation by thermal decomposition occurs, a halopropene of the formula:



20 wherein R₁, R₂, X and Y are independently hydrogen or a halogen selected from the group consisting of fluorine, chlorine, bromine and iodine, provided that least one of R₁, R₂, X and Y is a halogen and there is at least one hydrogen and one halogen on adjacent carbon atoms.

25 39. A process for the manufacture of 1,3,3,3-tetrafluoropropene comprising thermally decomposing a reactant comprising at least one of 1-chloro-1,3,3,3-tetrafluoropropane and 1,1,3,3,3-pentafluoropropane, under conditions sufficient to dehydrochlorinate 1-chloro-1,3,3,3-

tetrafluoropropane and/or to dehydrofluorinate 1,1,1,3,3-pentafluoropropane, to form a reaction product which comprises 1,3,3,3-tetrafluoropropene.

40. The process of claim 39, wherein the decomposing is conducted without a catalyst.

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41. The process of claim 39, wherein said decomposing is conducted with a catalyst selected from the group consisting of transition metal halides and oxides and combination thereof.

42. The process of claim 41, the catalyst is selected from, a group consisting of iron halides, nickel 10 halides, cobalt halides and combinations thereof.

43. The process of claim 40 wherein 1-chloro-1,3,3,3-tetrafluoropropane is dehydrochlorinated to form a reaction product which comprises 1,3,3,3-tetrafluoropropene.

15 44. The process of claim 40 wherein 1,1,3,3,3-pentafluoropropane is dehydrofluorinated to form a reaction product which comprises 1,3,3,3-tetrafluoropropene.

45. The process of claim 40 wherein said dehydrochlorination of 1-chloro-1,3,3,3-tetrafluoropropane and 20 said dehydrofluorination of 1,1,1,3,3,-pentafluoropropane are conducted simultaneously in the same reactor.

46. The process of claim 39 which is conducted at a temperature of from about 30°C to about 400°C.

47. The process of claim 39 which is conducted at a temperature of from about 50°C to about 350°C.

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48. The process of claim 39 which is conducted at a temperature of from about 75°C to about 300°C.

49. The process of claim 39 which is conducted at atmospheric pressure or under vacuum.

50. The process of claim 39 which is conducted a superatmospheric pressure.

5 51. The process of claim 38 which is conducted in the presence of the catalyst.

52. The process of claim 51 wherein the catalyst is selected from the group consisting of supported or bulk transition metal halides and oxides and combination thereof

10 53. The process of claim 52 wherein said catalyst comprises supported or bulk FeCl_2 , FeCl_3 , NiCl_2 or CoCl_2 .

54. The process of claim 39 wherein the 1-chloro-1,3,3,3-tetrafluoropropane and/or 1,1,1,3,3-pentafluoropropane are previously prepared by fluorinating 1,1,1,3,3-pentachloropropane with 15 hydrogen fluoride in the vapor phase in the presence of a fluorination catalyst.

55. The process of claim 54 wherein said fluorination catalyst is selected from the group consisting of transition metal halides, Group IVb metal halides, Group Vb metal halides and combinations thereof on activated carbon or fluorinated alumina.

20 56. The process of claim 54 wherein said fluorination catalyst is selected from the group consisting of SbCl_5 , SbCl_3 , SbF_5 , TaCl_5 , SnCl_4 , NbCl_5 , TiCl_4 , MoCl_5 , Cr_2O_3 , $\text{Cr}_2\text{O}_3/\text{Al}_2\text{O}_3$, $\text{Cr}_2\text{O}_3/\text{AlF}_3$, $\text{Cr}_2\text{O}_3/\text{carbon}$, $\text{CoCl}_2/\text{Cr}_2\text{O}_3/\text{Al}_2\text{O}_3$, $\text{NiCl}_2/\text{Cr}_2\text{O}_3/\text{Al}_2\text{O}_3$, $\text{CoCl}_2/\text{AlF}_3$, $\text{NiCl}_2/\text{AlF}_3$ and combinations thereof.

25 57. The process of claim 54 wherein said fluorination catalyst is selected from the group consisting of Cr_2O_3 , $\text{Cr}_2\text{O}_3/\text{carbon}$, $\text{Cr}_2\text{O}_3/\text{AlF}_3$, $\text{CoCl}_2/\text{AlF}_3$, $\text{NiCl}_2/\text{AlF}_3$ and combinations thereof.

58. The process of claim 54 wherein said fluorination catalyst comprises $SbCl_3$ or $SbCl_5$ supported on activated carbon.

5 59. The process of claim 54 wherein the fluorinating is conducted at a temperature of from about 100°C to about 350°C.

60. The process of claim 54 wherein the fluorinating is conducted at atmospheric pressure or under vacuum.

10 61. The process of claim 54 wherein the fluorinating is conducted at superatmospheric pressure.

62. The process of claim 54 wherein the mole ratio of hydrogen fluoride to 1,1,1,3,3-pentachloropropane is from about 2:1 to about 100:1.

15 63. The process of claim 54 further comprising feeding chlorine to the fluorinating reaction to keep the fluorination catalyst active.

64. The process of claim 39 wherein the 1-chloro-1,3,3,3-tetrafluoropropane and/or 1,1,1,3,3-pentafluoropropane are previously prepared by fluorinating 1,1,1,3,3-pentachloropropane with 20 hydrogen fluoride in a liquid phase in the presence of a fluorination catalyst.

65. The process of claim 64 wherein said fluorination catalyst is selected from the group consisting of transition metal halides, Group IVb metal halides, Group Vb metal halides and combinations thereof.

25 66. The process of claim 65 wherein said fluorination catalyst is selected from the group consisting of $SbCl_5$, $SbCl_3$, SbF_5 , $TaCl_5$, $SnCl_4$, $NbCl_5$, $TiCl_4$, $MoCl_5$, and combinations thereof.

67. The process of claim 66 wherein said fluorination catalyst is selected from the group consisting of SbCl₅, SbCl₃ and combinations thereof.

68. The process of claim 64 wherein the fluorinating is conducted at a temperature of from about 60°C to 5 about 180°C.

69. The process of claim 64 wherein the fluorinating is conducted at a pressure of from about 50 psig and 400 psig.

10 70. The process of claim 64 wherein the mole ratio of hydrogen fluoride to 1,1,1,3,3-pentachloropropane is from about 2:1 to about 100:1.

71. The process of claim 64 further comprising feeding chlorine to the fluorinating reaction to keep the fluorination catalyst active.

15 72. The process of claim 1, wherein said caustic solution further comprises a 1 to 5 carbon atom alcohol in an amount that is at least partially miscible with said caustic solution solvent.

73. The process of claim 1, wherein said caustic solution further comprises water in an amount that is 20 at least partially miscible with said caustic solution solvent.

74. The process of claim 1, conducted in a continuous manner.

75. The process of claim 35, wherein said process is conducted in a continuous manner